

REMARKS

At the outset, applicants would like to thank Examiner Rios and Examiner Sircus for the courteous and helpful interview conducted with co-applicant, Mr. Arnold Kehrli, and applicants' representative, Mr. Frank Occhiuti.

We have amended independent claims 1 and 9 to more particularly recite that the utility power network includes a transmission line which carries a nominal voltage and a distribution line network connected to the transmission line network, the distribution line network carrying a distribution voltage less than the nominal voltage on the transmission line network. Claim 1 has been further amended to recite that the voltage recovery device includes an energy storage unit connected in shunt to the distribution line network. We have also amended independent claim 9 to recite electrically connecting in shunt a voltage recovery device having an energy storage unit to the distribution line network. We have also cancelled dependent claim 10 and have added claims 24-28.

We have addressed the Examiner's § 112, second paragraph rejections in the amendments to the claims.

Prior Art Rejections

The Examiner has rejected claims 1-15, 17-21 and 23 as being unpatentable over Gyugyi U.S. 5,329,222 (hereafter Gyugyi '222). The Examiner acknowledges that Gyugyi '222 does not specifically disclose a voltage recovery device connected in shunt to the utility power network, but argues that Gyugyi U.S. 5,343,139 (hereafter Gyugyi '139) discloses a voltage recovery device that injects voltage into a utility power network with a shunt transformer and that voltage compensation using a series connected device can be performed with a properly controlled shunt recovery device. Thus, the Examiner argues that it would have been obvious to a person of skill in the art to combine the teachings of the Gyugyi '222 and '139 patents in order to provide reactive power compensation and execute indirect voltage and power control.

Independent Claim 1

We submit however that neither Gyugyi '222 nor Gyugyi '139, separately or in any proper combination, describe or suggest a voltage recovery device including an energy storage unit connected in shunt to the distribution line network and configured to transfer real and reactive power between the utility power network and voltage recovery device at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage, following a fault condition detected on the utility power network, as recited in amended claim 1.

As was discussed during our interview, Gyugyi '222 discloses "an energy storage and inverter system which can generate a voltage which is introduced in series with the utility distribution line so as to compensate for any dynamic deviation of the utility signal from the desired steady state waveform." (Col. 3, lines 50-54, emphasis added). Gyugyi '222 injects the voltage in series to the distribution line feeding one or more sensitive loads. In particular, Gyugyi '222 states:

"Thus, in the case of voltage sags, or transients which represent a dynamic change in real power which would otherwise be delivered to the load, there remains a need for an efficient and reliable mechanism for responding so as to minimize variations in the distribution line signal delivered to the loads that are tied to it." (Col. 3, lines 35-40, emphasis added).

Gyugyi '139, on the other hand, is directed to a power flow controller having an inverter connected in shunt to a transmission line of the utility power network, and not to a distribution line of the utility power network. The inverter (switching converter 1) is similar to a voltage-sourced inverter used in solid state VAR compensators.

We submit that a person of skill in the art would not modify the energy storage system of Gyugyi '222 to include a shunt connection as the Examiner suggests because the proposed modification would destroy the intended purpose and function of the Gyugyi '222 invention. It is a well-established principle of patent law that if a proposed modification to a reference renders the reference inoperable for its intended purpose, then the reference teaches away from that modification. See, In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) and MPEP § 2145 X.

D.

Gyugyi '222 explicitly states that the energy is injected "in series" to the power distribution line. And it is no accident that there is absolutely no mention in the Gyugyi '222 patent of injecting energy to the distribution line in shunt. We submit, as discussed during the interview, that substituting a shunt connection for the series connection used by Gyugyi '222 would impair the objective of minimizing variations in the distribution line signal delivered to the load. A shunt connection would, in fact, promote the injected energy to flow toward the transmission line network and away from the loads tied to the distribution feeder. That being the case, we submit that a person of skill in the art would not, in fact, be motivated to modify the Gyugyi '222 system in the manner proposed by the Examiner. For this reason alone, we submit that independent claim 1 is allowable over the cited references.

We submit that because claims 2, 4-8, 17, and 18 depend from claim 1, these claims are patentable for at least the same reason that claim 1 is patentable.

Independent Claim 9

We further submit however that neither Gyugyi '222 nor Gyugyi '139, separately or in any proper combination, describe or suggest a method of stabilizing a utility power network including electrically connecting in shunt a voltage recovery device having an energy storage unit to a distribution line network and operating, in response to detecting the fault condition, the voltage recovery device to transfer real power and reactive power to the distribution line network at a level and for a duration to recover the voltage on the utility power network to within a predetermined proportion of the nominal voltage, as recited in amended claim 9. As discussed above, we submit that a person of skill in the art would not adopt the Examiner's proposed modification of replacing the series connection of the Gyugyi '222 energy storage and inverter system with the shunt connection to a transmission system in the Gyugyi '139 power flow controller system.

We further submit that because claims 11-15, 19 and 20 depend from claim 9, these claims are patentable for at least the same reason that claim 9 is patentable.

Independent Claim 23

We also submit however that neither Gyugyi '222 nor Gyugyi '139, separately or in any proper combination, describe or suggest a method of stabilizing a utility power network including electrically connecting in shunt plural voltage recovery devices each having an energy storage unit to at least one of a plurality of distribution networks and operating, in response to detecting a fault condition, one or more of the voltage recovery devices to transfer real power and reactive power to the distribution network at a level and for a duration to recover the voltage on the transmission network to within a predetermined proportion of the nominal voltage, as recited in amended claim 23. As already discussed above, a person of skill in the art would not adopt the Examiner's proposed modification of replacing the series connection of the Gyugyi '222 energy storage and inverter system with the shunt connection to a transmission system in the Gyugyi '139 power flow controller system. Moreover, neither reference provides any clue to the concept of connection a plurality of voltage recovery devices to at least one a plurality of distribution networks connected to a transmission network carrying a nominal voltage, as recited in amended claim 23.